

Amendment dated November 4, 2008

Response to August 6, 2008 Non-Final Office Action

AMENDMENTS TO THE CLAIMS

The following listing of claims replaces all previous claims, and listings of claims, in the application.

1. (currently amended) A base plate for a power module comprising:
 - a metal plate;
 - a ceramic base plate that is joined to the metal plate and contains X as an element selected from the group consisting of aluminum and silicon; and
 - a release agent which includes boron provided in a joint surface between the metal plate and the ceramic base plate, wherein
 - a remaining amount of the release agent is less than 5 as an amount of boron measured by fluorescence X-ray analysis,
 - a ceramic crystal grain straining region in the joint surface of the ceramic base plate is equal to or less than 40%, and
 - the amount of boron is defined as a value obtained by an expression: (a peak height of B-K α / a peak height of X-K α) × 100000.
2. (currently amended) A base plate for a power module comprising:
 - a metal plate;
 - a ceramic base plate that is joined to the metal plate and contains X as an element selected from the group consisting of aluminum and silicon; and
 - a release agent which includes boron provided in a joint surface between the metal plate and the ceramic base plate, wherein
 - a remaining amount of the release agent is less than 5 as an amount of boron measured by fluorescence X-ray analysis,
 - an amount of ceramic crystal grain straining in the joint surface of the ceramic base plate is equal to or less than 0.03%, and
 - the amount of boron is defined as a value obtained by an expression: (a peak height of B-K α / a peak height of X-K α) × 100000.

3. (previously presented): The base plate for a power module according to claim 1, wherein the metal plate is made of aluminum, and the ceramic base plate is made of any one of aluminum nitride and silicon nitride.
4. (previously presented): A power module comprising:
the base plate for a power module according to claim 1; and
a semiconductor chip mounted on the metal plate of the base plate for a power module.
5. (withdrawn): An Al/AlN joint material comprising:
an aluminum member;
an aluminum nitride member joined to the aluminum member; and
a brazing material provided between the aluminum member and the aluminum nitride member, wherein
the brazing material infiltrates in a porous layer on a surface of the aluminum nitride member, and
at least a portion of the brazing material forms a three-dimensional network structure within substantially equal to or more than 0.5 layers and equal to or less than three layers of a crystal structure of the aluminum nitride member.
6. (withdrawn): The Al/AlN joint material according to claim 5, wherein
a diameter of the three-dimensional network structure is greater inside the aluminum nitride member than on a surface of the aluminum nitride member.
7. (withdrawn): A base plate for a power module, comprising:
an insulated base plate; and
a heat-releasing object provided on a first side of the insulated base plate,
Wherein
the insulated base plate is the Al/AlN joint material according to claim 5.

8. (withdrawn): A power module comprising:
the base plate for a power module according to claim 7; and
a chip which is mounted on a second side of the insulated base plate.

9. (withdrawn): A power module comprising:
the base plate for a power module according to claim 7; and
a heat sink which is any one of air-cooled and water-cooled mounted on a second side of
the insulated base plate.

10. (withdrawn): A manufacturing method of an Al/AlN joint material, comprising:
a first step of obtaining an AlN sintering body having a porous layer on a surface thereof
by sintering a powder of AlN; and
a second step of joining an Al member of the porous layer via a brazing material.

11. (withdrawn): The manufacturing method of an Al/AlN joint material according to claim
10, further comprising
a third step of removing a weak porous layer formed on a surface of the AlN sintering
body on which the Al member is joined, wherein
in the second step, the Al member is joined on the surface via the brazing material.

12. (withdrawn): The manufacturing method of an Al/AlN joint material according to claim
11, further comprising
in the fourth step, a joint surface is set in a vacuum, a liquid phase occurs in the brazing
material by heating, and the liquid of the brazing material is infiltrated in a porous layer of the
AlN sintering body.

13. (withdrawn): The manufacturing method of an Al/AlN joint material according to claim
12, wherein

in the fourth step, a joint surface is set in a vacuum, a liquid phase occurs in the brazing material by heating, and the liquid of the brazing material is infiltrated in a porous layer of the AlN sintering body.

14. (withdrawn): The manufacturing method of an Al/AlN joint material according to claim 12, wherein

in the second step, the Al member is joined to the AlN sintering body by allowing the brazing material to infiltrate the porous layer of the AlN sintering body by cooling and setting the liquid of the brazing material provided between the AlN sintering body and the Al member.

15. (previously presented): The base plate for a power module according to claim 2, wherein the metal plate is made of aluminum, and
the ceramic base plate is a plate made of any one of aluminum nitride and silicon nitride.

16. (previously presented): A power module comprising:
the base plate for a power module according to claim 2; and
a semiconductor chip mounted on the metal plate of the base plate for a power module.